

REMARKS

In the Office Action mailed August 10, 2005, the Office objected to the numbering of the pending claims.

Claims 80, 83, and 84 were rejected under 35 U.S.C. §112, first paragraph, for allegedly failing to comply with the written description requirement.

Claims 80, 83, and 84 were rejected under 35 U.S.C. §112, first paragraph, for allegedly failing to comply with the enablement requirement.

Claims 72-91 were rejected under 35 U.S.C. §103(a) for purportedly being obvious over U.S. Patent 5,868,819 to Guhde et al.

Applicant appreciates the careful and thoughtful review of the present application. It is respectfully submitted that in view of the clarifications presented herein, all pending claims are in condition for allowance.

A. Objection to Claims Should Be Withdrawn

Previously presented claims 10-29 have been renumbered as claims 72-91, in accordance with the Examiner's suggestion. It is believed that this objection has been remedied and should now be withdrawn.

B. Rejection of Claims 80, 83, and 84 Under 35 U.S.C. §112, First Paragraph, Should Be Withdrawn

These claims were rejected for alleged failure to comply with the written description requirement:

Claims 80, 83, and 84 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant's Specification at page 9, line 11 and page 11, paragraph 1 teaches that silane must be present. Hence, it is unclear how one of ordinary skill in the art would consider the Specification to teach that applicant had invented the claimed method, with its various claimed requirements, that includes application of a liquid formulation that lacks silane. In the absence of persuasive explanation for how the Specification conveys that applicant was in possession of the subject matter of these claims at the time of filing, rejection is appropriate.

Pages 2-3 of the Office Action.

It is respectfully submitted that the present specification does not teach "that silane must be present." No. The passages in the specification cited by the Office,¹ merely refer to the use of silane in certain preferred embodiment compositions.

The claimed compositions, methods, and resulting coatings or coated substrates may optionally include a silane. A closer reading of the specification confirms this. Referring to the abstract of the present specification, it is stated that, "[t]he compositions for providing the coating may also contain a substituent such as a water-reducible organofunctional silane...". Furthermore, under the heading, "Summary of Invention," various aspects of the invention are noted, many of which are described as not containing a silane component. For example, see the aspects of the invention described on page 5, lines 7-16; page 5, line 18 to page 6, line 3. The description of these aspects is silent with regard to the presence of silane. Under the description of the "Preferred Embodiments," various embodiments are disclosed which are described without reference to inclusion of a silane agent. For example, on page 15 beginning at line 10, various chromium containing coating compositions are described which do not contain a silane agent. In addition, many of the independent claims included in the application as originally filed, recite compositions, methods, or resulting coatings or coated substrates that do not call for or require a silane agent. For example, see independent claims 1, 10, 28, 39, 42, 55, 57, and 70.

In view of the foregoing, it is respectfully submitted that the written description requirement is met for claims 80, 83 and 84 since the original specification, as filed, includes sufficient written description support for methods involving the use of a coating composition that does not include a silane agent.

C. Rejection of Claims 80, 83, and 84 Under 35 U.S.C. §112, First Paragraph, Should Be Withdrawn

The Office asserted in this regard:

Claims 80, 83, and 84 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Omitting limitations critical or essential to the practice of the invention, but not included in the claim(s), is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Applicant's Specification at page 9, line 11 and at page 11, paragraph 1 teaches that silane is a critical ingredient of the coating formulation. Hence, the claims would not appear to be enabled for a coating formulation that lacks silane, and so rejection is

¹ Page 9, line 11 and page 11, paragraph 1.

appropriate.

Page 3 of the Office Action.

For the reasons previously expressed and set forth in section B herein, it is respectfully submitted that the present specification is in fact, sufficiently enabling for claims 80, 83, and 84. Accordingly, this ground of rejection should be withdrawn.

D. Rejection of Claims 72-91 Under 35 U.S.C. §103(a) Should Be Withdrawn

These claims were rejected as obvious as follows:

Claims 72-91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guhde et al. USP 5,868,819. Guhde et al. teaches a method of coating a substrate that includes preparing an aqueous formulation comprised of water, zinc flake, and silane, applying it to a substrate surface, and heat treating the applied solution to obtain a corrosion resistant surface coating. Guhde suggests that the zinc flake may be zinc/aluminum alloy flake, wherein the aluminum content would not exceed 50 weight percent. See Guhde (Abstract; col. 2, line 23 through col. 5, line 23; col. 6, line 31 through col. 7, line 10; col. 8, line 35 through col. 9, line 59; col. 14, line 45 through col. 16, line 10; and Claim 24). It would have been obvious to one of ordinary skill in the art at the time of the invention to fabricate the flake material of Guhde with a zinc/aluminum alloy, rather than zinc or zinc and aluminum separate flakes, as Guhde teaches that effective flakes may be comprised of zinc/aluminum alloys, wherein the amount of aluminum is less than 50 weight percent. Guhde may not exemplify the components of Claims 87-89, but does teach that effective compositions may comprise these components. It would have been obvious to one of ordinary skill in the art at the time of the invention to fabricate the formulation of Guhde with these ingredients in the claimed amounts as Guhde teaches that effective formulations result when they are included.

Pages 4-5 of the Office Action.

The methods recited in the pending claims all recite, in part, forming a liquid coating composition that includes "zinc alloy in flake form comprising greater than 50 weight percent zinc in the flake, and a balance of less than 50 weight percent of additional alloy metal." The use of such a zinc majority alloy in flake form is an important aspect of the present invention.

U.S. Patent 5,868,819 to Guhde et al. was cited in the "Background of the Invention" in the present application.² That patent relates to a water-reducible coating composition containing particulate metal. The '819 patent teaches the use of particulate metals which can include mixtures of two or more metals, including zinc.

² See page 3, lines 1-4 of the present application.

Although the '819 patent contains an isolated mention that the "particulate metal may...comprise alloys and intermetallic mixtures" of various metallic pigments (including zinc),³ the '819 patent actually teaches that if more than one type of metal is used, then the individual metals are each added separately and a mixture is formed. For example, in Example 1 of the '819 patent, beginning at col. 14, 37 grams of aluminum flake paste are added to 266 grams of zinc paste. Examples 2 and 3, and others, use a similar mixture of aluminum flakes and zinc paste.

In view of the foregoing, it is respectfully submitted that the '819 patent does not fairly teach using the particular zinc majority alloy in flake form as recited in the pending claims.

Even if the '819 patent were considered to teach such specific zinc alloys (which Applicants strongly dispute), the pending claims are non-obvious and patentable over the '819 patent due to the unexpected results of the recited methods utilizing the particular zinc majority alloy in flake form. The present application contains extensive description and evidence of comparative testing in which methods using the zinc alloys, corresponding to the pending method claims, are compared to similar methods, however using mixtures of zinc and other metals.

In Examples 1 and 2 of the present application, coating compositions using a zinc alloy and a mixture including zinc, respectively, were prepared:

EXAMPLE 1

* * *

To this mixture there is added 35.2 weight parts of STAPA 4ZnAl7 zinc and aluminum alloy flake paste. The paste contains about 85 weight percent zinc, about 5 weight percent aluminum, and a balance of paste liquid. The alloy flake has about 50 percent of the flake particles with a longest dimension of discrete particles of less than about 13 microns.

Page 35, lines 12-16 of the application.

EXAMPLE 2

* * *

To this mixture there is added 32.6 weight parts of STAPA 4ZnSn30 zinc and tin alloy flake paste. The paste contains about 70 weight percent zinc

³ See col. 4, lines 46-53 of the '819 patent.

and about 30 weight percent in the alloy flake, on a metals basis, and a balance of paste liquid.

* * *

For comparative purposes, there is prepared a standard comparative coating composition using the procedure described hereinabove. For this composition there is blended with the initial silane blend an additional 29.4 weight parts of water and a blend of 1.5 weight parts of each wetter, 2 weight parts of the silane, 0.7 weight part of the 1-nitropane, 1.2 weight parts of dipropylene glycol, and 4.3 parts of aluminum flake paste. To this there is added 31.2 parts of zinc flake paste.

Page 38.

Test parts were then coated with either the composition containing zinc alloy or the composition containing zinc in a metallic mixture. The test parts coated with the zinc alloy-containing composition significantly outperformed the parts treated with the zinc mixture-containing composition:

The resulting coated parts were then subjected to the hereinbefore described corrosion-resistance test. The test parts with the silicate topcoat and zinc plus tin alloy undercoat went for 1080 hours in testing with a rating of 4.8 on a scale of 5.0 (best) in regard to appearance of red rust. Comparatively the test parts with the silicate topcoat and the zinc flake plus aluminum flake undercoat at 1,080 hours of testing had a rating of 4.2.

Page 39.

These surprising and unexpected results were again confirmed in another series of testing trials, also set forth in the present specification:

EXAMPLE 3

* * *

To this mixture there is added 29.83 weight parts of zinc and aluminum alloy flake paste. The paste contains about 85 weight percent zinc and about 6 weight percent aluminum in the alloy flake and an about 9 weight percent balance paste liquid. The alloy flake has about 98 percent of the flake particles with a longest dimension of discrete particles of less than about 15 microns. The sum of all of these ingredients is then vigorously mixed together.

* * *

For comparative purposes, there is then used the standard comparative coating composition described in Example 2.

* * *

The resulting coated bolts are then subjected to the Society of Automotive Engineers corrosion test SAE J2334. The test cycle was a 24-hour test cycle. In each test cycle there was used a humid stage, a salt application stage and a dry stage. The humid stage was 100% humidity for 6 hours at 50°C. The salt application stage was for 15 minutes at ambient conditions.

The dry stage was 50% humidity at 60°C for 17 hours and 45 minutes.

In the test, the bolts coated with the standard comparative coating showed first red rust at 56 cycles. However, the bolts coated with the invention test composition passed 89 cycles with no red rust.

Pages 40-41.

The results of this testing demonstrate the surprising and unexpected advantages of using the particular zinc majority alloy flakes in the specific methods recited by the pending claims. It is respectfully submitted that these claims are allowable over the limited teachings of the '819 patent.

E. Conclusion

In view of the foregoing, it is respectfully urged that all claims 72-91 are in condition for allowance.

In the event that the Office is inclined to still maintain any of the latest rejections, the Examiner is respectfully requested to telephone the undersigned to discuss the reasons therefor.

Respectfully submitted,

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October 26, 2005
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CERTIFICATE OF MAILING

Under 37 C.F.R. § 1.8, I certify that this Amendment is being

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